DOCUMENT RESUME

ED 093 694 SE 018 031

AUTHOR	Hopkins, Roberta
TITLE	Supplementary Kits for Individualized Instruction.
INSTITUTION	Delaware State Dept. of Public Instruction, Dover.; Del Mod System, Dover, Del.
SPONS AGENCY	National Science Foundation, Washington, D.C.
REPORT NO	NSF-GW-6703
PUB DATE	Jun 73
NOTE	15p.
AVAILABLE FROM	Mr. John F. Reiher, State Supervisor of Science and Environmental Education, Department of Public Instruction, John G. Townsend Building, Dover, Delaware 19901 ($1.00, make checks payable to the Del Mod System)
EDRS PRICE	MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS	*Autoinstructional Aids; *General Science; Individualized Instruction; Instruction; Instructional Materials; Learning Disabilities; *Middle Schools; Science Education; Science Instruction; Secondary School Science; Teacher Developed Materials
IDENTIFIERS	*Del Mod System

ABSTRACT

The purpose of the kits is to facilitate the teaching of basic science skills. The kits can be used in the regular classroom for which they were designed or as instruments for teaching of students in learning disability classes. The kits are designed in the areas of plants, animals, metric measurement, chemistry, geology, and space study. Each kit includes the titles of the activities, a suggested level, objectives and necessary supplies needed. A guide to kit assignment by process is presented as well as a table indicating breakdown of kits by grade level. (ES)

BEST COPY AVAILABLE

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED 093694

SUPPLEMENTARY KITS FOR INDIVIDUALIZED INSTRUCTION

Prepared By

Roberta Hopkins
APPOQUINIMINK SCHOOL DISTRICT

June 30, 1973

Printed and disseminated through the office of the Del Mod Component Coordinator for the State Department of Public Instruction, John G. Townsend Building, Dover, Delaware 19901

SE 018 031

Preparation of this monograph was supported by the National Science Foundation Grant No. G.W. 6703 to the Del Mod System, P. O. Box 192, Dover, Delaware 19901

THE COUNCIL OF PRESIDENTS

THE UNIVERSITY OF DELAWARE

E. Arthur Trabant, *President*
Daniel C. Neale, *Coordinating Council on Teacher Education*
Robert L. Uffelman, *Coordinator*

DELAWARE STATE COLLEGE

Luna I. Mishoe, *President*
M. Milford Caldwell, *Coordinating Council on Teacher Education*
Ralph Hazelton, *Coordinator*

DELAWARE TECHNICAL AND COMMUNITY COLLEGE

Paul K. Weatherly, *President*
Ruth M. Laws, *Coordinating Council on Teacher Education*
Ethel L. Lantis, *Coordinator*

STATE DEPARTMENT OF PUBLIC INSTRUCTION

Kenneth C. Madden, *President*
Randall L. Broyles, *Coordinating Council on Teacher Education*
John F. Reiher, *Coordinator*

DEL MOD SYSTEM

Charlotte H. Purnell, *State Director*
John A. Bolig, *Research Director*

PROJECT SUMMARY

During the current school year Del-Mod funding was used to develop individualized kits for science instruction in the Redding Middle School of the Appoquinimink School District. During the year 36 kits were developed and equipped. The kits were designed in the areas of Plants, Metric Measurement, Chemistry, Animals, Geology and Space Study.

The purpose of the kits was to facilitate the teaching of basic science skills or processes. At the present time all kits are in use in the classroom. We have found them to be very effective in teaching remedial skills to students.

In addition to facilitating the instruction in the regular classroom for which they were designed we have also found the kits to be an instrument for teaching science to students who would normally not be getting science instruction due to placement in learning disability classes.

PLANT KITS

Title	Level	Objectives	Supplies
1. Identifying Trees	3	1The student will be be able to write the names of 10 common trees. 2The student will be able to name the main parts of a tree and describe how each aids the total organism.	Audubon Tree flash cards Audubon Tree study program
2. Identifying Wild-flowers	2	1The student will be able to group wild-flowers according to color when presented with a picture of the flower with an 80% accuracy level.	Audubon wildflower cards Audubon flower study program
3. Grouping Plants	5	1All students will be able to classify plants to phylum using preserved specimens and a plant identification key, with an 80% accuracy level.	Specimen jars -10 10 plants plant ID key
4. How Plants Live and Grow	4	1All students will be able to write a sentence describing the life cycle of each of the 3 major phylums of plants.	Plant specimens (set) Book on plants
5. Plants under the Microscope	4	1All students will be able to draw a plant cell and label it's parts. 2All students will be able to observe the differences in different types of plant tissues.	Microscope Plant slides Drawing paper

MEASUREMENT KITS

Title	Level	Objectives	Supplies
1. Measuring Length	4	1The student will be able to measure the length of an object with an accuracy of ± .5 cm using a metric ruler. 2The student will be able to order objects on the basis of length.	metric ruler 10 strips paper
2. Measuring Volume	3	1. The student will be able to determine the volume of a container with an accuracy of ±2 ml. using a graduated cylinder. 2 The student will be able to order objects on the basis of volume.	graduated cylinder 10 containers 1 bucket
3. Measuring Weight	4	1 The student will be able to determine the weight of an object within ± 1 gm using a balance and metric weights. 2 The student will be able to order objects on the basis of weight.	balance metric weights 10 objects

CHEMISTRY KITS

Title	Level	Objectives	Supplies
1. Clay Boats	3	The student will be able to identify at least 3 variable that influence the floating of the boat.	clay bucket paper clips aluminum foil
2. Making a Chemical Test	5	The student will be able to determine if a substance is an acid or a base using red and blue litmus paper	litmus paper test tubes test tube rack vinegar baking soda eye dropper watch glass
3. Elements, Compounds and Mixtures	4	The student will be able to define operationally an element, a compound and a mixture	iron sulfur magnet burner test tube test tube clamp matches safety glasses
4. Physical and Chemical Change	4	The student will be able to define operationally a physical and a chemical change.	paper burner matches forceps safety glasses
5. Making Molecule Models	5	The student will be able to construct molecule models given a molecule model kit and a list of chemical formulas.	molecule model kit
6. Finding Out About Heat and Temperature	3	1. The student will be able to read degrees on a Centigrade thermometer ± 1 degree. 2 The student will be able to construct a table of data from observations he has made. 3 The student will be able to construct a line graph from a table of data.	thermometer test tube graph paper beaker

Title	Level	Objectives	Supplies
7. Experimenting On Your Own	4	1 All students will be able to name 2 variables which affect a physical or a chemical change. 2 All students will be able to write a hypotheses based on a written description of the activity. 3 All students will be able to construct a table of data based on their own observations.	experiment cards "junk box"

HUMAN BODY KITS

Title	Level	Objectives	Supplies
1. Your Heart	4	1 All students will be able to determine heart rates using a stethoscope and a clock. 2 All students will be able to construct a bar graph from a set of data.	stethoscope graph paper
2. Typing Blood	5	Each student will be able to determine his blood type using a blood typing kit	blood typing kit microscope
3. Bones	2	1 All students will be able to observe characteristics of bones and will exhibit this through lab drawings. 2 The student will be able to measure an object ± 1 cm, using a metric ruler.	cat skull drawing paper ruler

SOLAR SYSTEM KITS

Title	Level	Objective	Supplies
1. The Laws of Motion	3	1. All students will be able to write the first law of thermodynamics. 2 All students will be able to define operationally kinetic and potential energy. 3 All students will be able to write the second law of thermodynamics.	pendulation game
2. Examining Light	3	1 All students will be able to reproduce on paper the spectrum from a prism. 2 All students will be able to write a sentence describing the nature of "white" light.	prism crayons colored paper
3. Making a Solar System Model	4	1 The student will be able to construct a model of the solar system using a kit on the solar system and reference materials on the solar system.	solar system kit book on Solar System
4. Constellations	5	The student will be able to read and interpret a star chart.	star chart

ANIMAL KITS

Title	Level	Objectives	Supplies
1. Identifying Birds	2	1 All students will be able to group birds according to color when presented with pictures of them with 90% accuracy. 2 All students will be able to write the names of 10 common birds.	bird flash cards bird study program
2. Identifying Mammals	4	1 All students will be able to name 5 animals that are mammals and 5 that are not. 2 The student will be able to classify mammals as carnivores, herbivores and omnivores when presented with pictures of animals and their habitas with 70% accuracy.	mammal flash cards
3. Finding Out About Animals	5	1.All students will be able to classify animals wo phylum with 70% accuracy using preserved specimans and an animal classification key.	preserved animals specimen jars animal key
4. Animal Habitats	5	1 Students will be able to name the habitat for an animal when presented with the specimen and a reference book. 2 All students will be able to make lab drawings of animals showing their major features; such as, number of body segments, and number of legs.	preserved animals reference books specimen jars colored pencils

Title	Level	Objectives	Supplies
5. Insect Life Cycles	3	The student will be able to write a paragraph describing a complete and an incomplete life cycle.	moth life cycle paper wasp life cycle dragonfly life cycle
6. Harmful and Beneficial Insects	6	1 The student will be able to classify insects as harmful or beneficial based on observations and readings with a 90% accuracy level. 2 The student will be able to construct a table of data based on his observations.	insect collection book on insects

GEOLOGY KITS

Title	Level	Objectives	Supplies
1. Fossils	5	1 The student will be able to name 5 characteristics of fossils. 2 The student will be able to identify similarities and differences between fossil specimens and group the fossils on the basis of those characteristics with an 80% accuracy level.	fossil collection
2. Making a Contour Map	4	1 The student will be able to make a contour map from a landform model.	landform model kit ruler beaker crayons
3 Map Reading	6	The student will be able to construct a contour map from an aeriel photograph.	stereo photo kit
4. Identifying Minerals	5	The student will be able to identify minerals correctly 80% of the time using a mineral collection and a Moh's hardness scale.	mineral collection-hardness
5. What is a Rock?	4	The student will be able to develop a definition for the word rock afeter examining rock specimens.	What is a Rock? kit
6. What is a Streak test?	4	The student will be able to identify 8 of 10 rocks using a mineral collection and a mineral key and a streak plate.	What is a Streak test kit

Title	Level	Objectives	Supplies
7. Dinosaurs	1	The student will be able to divide dinosaur models on the basis of color with 90% accuracy.	dinosaur kit
8. Landforms	1	The student will be able to construct models of mountains, volcanoes and valleys using clays and photographs of the landforms.	modeling clay book on landforms

GUIDE TO KIT ASSIGNEMENT BY PROCESS

BEST COPY AVAILABLE

PROCESS	UNIT						
	Plants	Measurement	Chemistry	Human Body	Solar System	Animals	Geology
Classifying	1,2,3,5		1,2	2		1,2,3,4,5,6	1,4,5,6,7
Observing	1,2,3,	1,2,3	1,2,3,5,7	1,2,3	1,2,3,4	1,2,3,4,5,6	1,4,5,6,7,8
Time/space			6,7	1	1		2,3
Ordering	5	1,2,3		1	3,4	5	1,4,6
Measuring	3	1,2,3	1,5,7	1,3		3	2,3,4,5
Inferring	3,4,5		3,4	2	1,2	2,3,5	5,5,8
Predicting	1,2,3		1,2,4,5,7		2,3,4	6	5,6
Controlling variables			1,2,4,5,7	2	1		
Defining operationally	4		3,4,5		1,2		5,6
Formulating models	2		4,5		1,3,4	5,6	2,3,5,4,7,8
Interpreting data	3	1,2,3	1,2,3,4,5,7	1,2,3	1,2,3,4	3,4,5,6	1,2,3,4,6,5,7,8
Testing	2		1,2,3,4,5,7	1,2,3	1,2		6
Analyzing systems	1,2		4,5,6		1,3,4	5	2,3,8
Communicating	1,2,3,4,5	1,2,3	1,2,3,4,5,6,7	1,2,3	1,2,3,4	1,2,3,4,5,6	1
Experimenting			1,3,4,6,7	1,2	1,2		6
Hypothesizing			7		2	4,5,6	5

Number refers to a kit in that unit series.

BREAK DOWN OF KITS BY GRADE LEVEL

Grade Level	Plants	Measurement	Chemistry	Human Body	Solar System	Animals	Geology	Total
1	0	0	0	0	0	0	2	2
2	1	0	0	1	0	1	0	3
3	1	1	2	0	2	1	0	7
4	2	2	3	1	1	1	3	13
5	1	0	2	0	1	2	2	7
6	0	0	0	1	0	1	1	3
Total	5	3	7	3	4	6	8	36

Number indicates number of units at that grade level.